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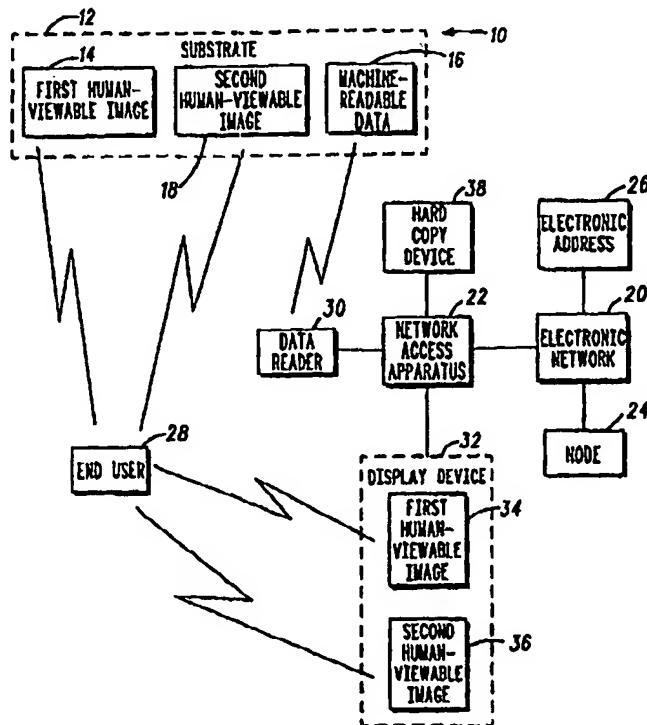
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(21) International Application Number: PCT/US97/19606 (22) International Filing Date: 4 November 1997 (04.11.97) (30) Priority Data: 08/744,338 7 November 1996 (07.11.96) US (71) Applicant (for all designated States except US): MOTOROLA INC. [US/US]; 1303 East Algonquin Road, Schaumburg, IL 60196 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): REBER, William, L. [US/US]; 1029 Buccaneer Road, Schaumburg, IL 60916 (US). PERTTUNEN, Cary, D. [US/US]; 11764 Raintree Court, Shelby Township, MI 48315 (US). (74) Agents: TOLER, Jeffrey, G. et al.; Motorola Inc., Intellectual Property Dept., 1303 East Algonquin Road, Schaumburg, IL 60196 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.	

(54) Title: METHOD, SYSTEM, AND ARTICLE OF MANUFACTURE FOR PRODUCING A NETWORK NAVIGATION DEVICE

(57) Abstract

A method of producing a network navigation device which includes writing machine-readable data (16) to a substrate (12), and writing a human-viewable image (14) to the substrate (12). The machine-readable data (16) provides an instruction for linking to a resource in an electronic network (20). The human-viewable image (14) is associated with the resource.



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0 METHOD, SYSTEM, AND ARTICLE OF MANUFACTURE
FOR PRODUCING A NETWORK NAVIGATION DEVICE

Background of the Invention

5 The introductory chapter of Discover the World
Wide Web with Your Sportster, Second Edition,
provides a commentary on the present state of the
Internet and the World Wide Web. In this
reference, it is stated that the Internet is in
10 need of an application which will transform the
"much-hyped but difficult-to-use linking of
computers around the world to being a highly
informative, highly usable database and
communications tool." It is further stated that
15 the various available Web browsers (e.g. Mosaic
and Netscape Navigator) all have difficulties and
limitations which make them insufficient to handle
the complexity of the Internet.

Part of the problem is in the complexity of
20 addressing a resource on the World Wide Web. The
World Wide Web uses an addressing system known as
a URL (Uniform Resource Locator) that defines the
location of a resource on the Internet. URLs are
comprised of up to four parts: a protocol, a
25 domain name, a path, and a filename. The
combination of these four parts can produce a
complex address for a resource. For example, the
address for information on two-way pagers on the
Motorola home page is:
30 [http://www.mot.com/MIMS/MSPG/Products](http://www.mot.com/MIMS/MSPG/Products/Two-way/tango/desc.html)
[/Two-way/tango/desc.html](http://www.mot.com/MIMS/MSPG/Products/Two-way/tango/desc.html).

Another part of the problem is in the rapid
increase of the number of entities and the number
of resources on the World Wide Web. Many entities

0 are finding that domain names which they desire
are already reserved. As a result, some entities
have to purchase their desired domain name from
another holder, or have to reserve a less than
desirable domain name. Further, as the number of
5 resources increases, newly-formed URLs become less
intuitive and greater in length.

Resolving the problem of address complexity is
important as various companies propose Internet
navigation systems for the masses.

10 Accordingly, there is a need for an improved
device for navigating in an electronic network.

Brief Description of the Drawings

15 The invention is pointed out with
particularity in the appended claims. However,
other features of the invention may become more
apparent and the invention may be best understood
by referring to the following detailed description
20 in conjunction with the accompanying drawings in
which:

FIG. 1 is a block diagram of an embodiment of
a network navigation device in accordance with the
present invention;

25 FIG. 2 is a flow chart of an embodiment of a
method of producing a network navigation device in
accordance with the present invention;

FIG. 3 is an illustration of a first network
navigation device generated in accordance with an
30 embodiment of the present invention;

0 FIG. 4 is an illustration of a second network navigation device generated in accordance with an embodiment of the present invention;

5 FIG. 5 is an illustration of one surface of a third network navigation device generated in accordance with an embodiment of the present invention;

 FIG. 6 is an illustration of an opposing surface of the third network navigation device;

10 FIG. 7 illustrates a fourth network navigation device generated in accordance with an embodiment of the present invention;

 FIG. 8 illustrates a fifth network navigation device generated in accordance with an embodiment of the present invention;

15 FIG. 9 illustrates a sixth network navigation device generated in accordance with an embodiment of the present invention;

20 FIG. 10 is a general diagram that illustrates an example of a network access apparatus and examples of various data readers for reading machine-readable data from a network navigation device;

25 FIG. 11 is a flow chart of an embodiment of a method of linking to a resource in an electronic network;

 FIG. 12 illustrates an example display of content of a resource using the network navigation device of FIG. 3;

30 FIG. 13 illustrates an example of a step of receiving a user-initiated event associated with a print request;

0 FIG. 14 illustrates an example of a hard copy
output produced in response to receiving a print
command;

5 FIG. 15 is a flow chart of an embodiment of a
method of producing a network navigation device
based on a browsing history of the end user;

 FIG. 16 is an illustration of a first
embodiment of a network navigation device for a
plurality of resources;

10 FIG. 17 is an illustration of a second
embodiment of a network navigation device for a
plurality of resources;

 FIG. 18 is an illustration of a third
embodiment of a network navigation device for a
plurality of resources;

15 FIG. 19 is a flow chart of an embodiment of a
method of producing a network navigation device;

 FIG. 20 is a block diagram of an embodiment of
a system for producing a network navigation
device;

20 FIG. 21 illustrates an embodiment of a
substrate for use in forming a network navigation
device;

 FIG. 22 is an illustration of the substrate of
FIG. 21 in a first partially-folded state;

25 FIG. 23 is an illustration of the substrate of
FIG. 21 in a second partially-folded state;

 FIG. 24 is an illustration of the substrate of
FIG. 21 in a third partially-folded state; and

30 FIG. 25 is an illustration of the substrate of
FIG. 21 in a completely-folded state.

0 Detailed Description of the Preferred Embodiments

Embodiments of the present invention advantageously provide methods and systems for producing a network navigation device for
5 automatically linking a user to a resource in an electronic network. One such device includes a human-viewable image associated with the resource and machine-readable data for navigating to the resource. A user may access the resource by
10 having machine-readable data read using a data reader rather than by typing an electronic address. As a result, the addressing format and the address itself become more transparent to the user. Consequently, the problem of address
15 complexity and the criticality of reserving desired domain names is reduced.

Additionally, methods and systems are provided for an end user or for an automated service to produce network navigation devices. The methods
20 can be advantageously utilized by the end user within a document browser software program, a word processor program, or a desktop publishing program, for example. The systems and the methods for producing the network navigation device are
25 well-suited for utilization by the masses to navigate to desired sites on the Internet and the World Wide Web.

FIG. 1 is a block diagram of a network navigation device 10 in accordance with a
30 particular embodiment of the present invention. The network navigation device 10 comprises a

0 substrate 12, a first human-viewable image 14
supported by the substrate 12, and machine-
readable data 16 supported by the substrate 12.
Optionally, the network navigation device further
comprises a second human-viewable image 18
5 supported by the substrate 12.

 The first human-viewable image 14 is
preferably indicative of a resource in an
electronic network 20. The second human-viewable
image 18 may preferably indicate any combination
10 of: a client routine (e.g. an Internet or intranet
browser routine) which is utilized to display the
resource, a service provider (e.g. an Internet
service provider) which connects a network access
apparatus 22 to the electronic network 20, a
15 service which provides the resource to a network
access apparatus 22 via the electronic network 20,
or an advertiser.

 Optionally, a node 24 in the electronic
network 20 is used to provide the resource to an
20 end user 28. Here, the resource can be locally
present at the node 24 or can be at another
electronic address 26 in the electronic network
20. Further, the node 24 can include a mirror
server to provide resources found elsewhere on the
25 electronic network 20.

 Although embodiments of the present invention
can be advantageously utilized for any electronic
network having an electronic addressing scheme for
identifying servers and information contained
30 therein, of particular interest are embodiments of
the present invention where the electronic network

0 20 includes the Internet, the World Wide Web, or
an intranet. In this case, the machine-readable
data 16 can include an electronic address to
identify the resource, such as at least a portion
of a URL or an IP (Internet Protocol) address.
5 Alternatively, the machine-readable data 16 can
include a code from which the node 24 identifies
the resource.

It is noted that a URL can includes up to four
parts: a protocol, a domain name, a path, and a
10 filename. URL protocols include: "file:" for
accessing a file stored on a local storage medium;
"ftp:" for accessing a file from an FTP (file
transfer protocol) server; "http:" for accessing
an HTML (hypertext marking language) document;
15 "gopher:" for accessing a Gopher server; "mailto:"
for sending an e-mail message; "news:" for linking
to a Usenet newsgroup; "telnet": for opening a
telnet session; and "wais:" for accessing a WAIS
server. Consequently, network navigation devices
20 in accordance with the present invention can be
utilized for initiating any of the above tasks.

The first human-viewable image 14 can include
textual information and/or graphical information
which preferably provides an intuitive and/or
25 understandable representation of the resource. As
an example, to provide a network navigation device
for the Motorola Web page on two-way pagers, the
human-viewable image 14 can include textual
information such as "Motorola" and/or "Two-Way
30 Pagers", graphical information such as an image or
an illustration of a Motorola two-way pager, or a

0 combination of textual information and graphical
information. Such a human-viewable image is more
intuitive and more understandable to the end user
28 than an electronic address having the form of
[http://www.mot.com/MIMS/MSPG/](http://www.mot.com/MIMS/MSPG/Products/Two-way/tango/desc.html)
5 [Products/Two-way/tango/desc.html](http://www.mot.com/MIMS/MSPG/Products/Two-way/tango/desc.html).

The second human-viewable image 18 can include
textual information and/or graphical information,
such as information which indicates to the end
user 28 a service (e.g. a node service, a service
10 provider, a client routine, and/or an advertiser)
which is providing the resource. For example, the
second human-viewable image 18 can include textual
information such as "Brought to you by" and the
name of the service, graphical information such as
15 a logo for the service, or a combination of
textual information and graphical information.

The machine-readable data 16 is communicated
to the network access apparatus 22 by a data
reader 30. The form of the data reader 30 is
20 dependent upon the form of the machine-readable
data 16. For printed data, the data reader 30 can
include an optical imaging reader such as a
scanning wand, a linear CCD (charge coupled
device) reader, or a two-dimensional CCD reader.
25 For magnetically-stored data the data reader 30
can include a magnetic read head, such as those
within a magnetic stripe reader. For
electronically-stored data, the data reader 30 can
include a suitable electronic interface or a
30 receiver.

0 If desired, the machine-readable data 16 can
be selected to be readable by more than one type
of data reader. For example, printed data can be
printed with a magnetic substance, such as
5 magnetic ink, so as to be readable by both an
optical reader and a magnetic reader.

 Generally, the machine-readable data 16 can
include instructions which direct the network
access apparatus 22 to execute any combination of:
a predetermined client routine (e.g. a
10 predetermined Internet browser routine), a
predetermined network provider access routine
(e.g. dialing and logging on to a predetermined
service provider), and navigation instructions for
automatically linking the network access apparatus
15 22 to the electronic address 26 via the electronic
network 20.

 The network access apparatus 22 can have a
variety of forms, including but not limited to, a
general purpose computer, a network computer, a
20 network television, an internet television, a
portable wireless device, a television receiver, a
game player, a video recorder, and an audio
component. A display device 32, such as a monitor
or a television, is coupled to the network access
25 apparatus 22 to display visual content of the
resource upon linking to the electronic address
20. To reinforce the association between the
network navigation device 10 and the resource, a
first image 34 viewable on the display device 32
30 upon linking to the resource may be similar to (or
can be equivalent to) at least a portion of the

0 first human-viewable image 14. To reinforce the
association between the network navigation device
10 and the service which provides the resource, a
second image 36 viewable on the display device 32
may be similar to (or can be equivalent to) at
5 least a portion of the second human-viewable image
18.

The network access apparatus 22 can
communicate with a hard copy device 38 to provide
a hard copy representation of an experience
10 provided by the network navigation device 10. The
hard copy device 38 can have a variety of forms,
including but not limited to, a printer, a laser
printer, an ink jet printer, a thermal printer, a
plotter, and a fax machine.

15 The hard copy representation allows the end
user 28 to retrace an experience or navigation
session initiated by the network navigation device
10. The hard copy representation can include at
least a portion of the content from one or more
20 resources of the electronic network 20 accessed
during the experience. For example, the hard copy
representation can include a plurality of images
in a gallery form which summarize the experience.
Alternatively, or in addition thereto, the hard
25 copy representation can include a map which
summarizes the electronic addresses visited during
the experience.

If desired, the hard copy device 38 can print
the hard copy representation onto the substrate
30 12, or onto another substrate which can be
attached to the substrate 12. As a result, a

0 souvenir of the navigation session is physically
linked to the network navigation device 10 which
initiated the navigation session.

5 FIG. 2 is a flow chart of an embodiment of a
method of producing a network navigation device in
accordance with the present invention. As
indicated by block 40, the method includes a step
of providing a substrate, such as the substrate 12
in FIG. 1.

10 Preferably, the substrate 12 is formed by a
substantially flat piece of material. Examples of
materials which can be utilized to form the
substrate 12 include, but are not limited to,
dielectric materials such as paper, cardboard, and
15 plastic, and substantially nonmagnetic materials.
If desired, the material and its thickness can be
selected so that the substrate 12 is stiff, yet
flexible. It is noted that, in general, the
substrate 12 need not be homogeneous, i.e. more
than two materials can be utilized to form the
20 substrate 12.

It is also preferred that the substrate 12 be
shaped and sized to facilitate ease in handling by
individuals, such as the end user 28. For this
purpose, the substrate 12 can be card-shaped.
25 Here, for example, the substrate 12 can have the
size of a business card, a credit card, an index
card, a trading card (e.g. a baseball card), or a
playing card (e.g. from a deck of playing cards).

30 In other embodiments, the substrate 12 is
shaped and sized as a sheet or a page. Here, the
substrate 12 can comprise a standard-sized or a

0 custom-sized sheet of printing material. Examples
include, but are not limited to, letter-sized
paper, legal-sized paper, A4-sized paper, and
11x17 inch paper. The substrate 12 can include a
5 page in a book, a magazine, a newspaper, or other
printed publication.

It is noted that the substrate 12 can be
folded or attached to a page which is folded. As
a result, the network navigation device 10 can
assume two profiles: (i) an unfolded profile which
10 provides surface areas for supporting all of the
machine-readable data 16, the human-viewable
images 14 and 18, and additional information; and
(ii) a smaller, folded profile which provides
smaller externally-accessible surfaces for
15 supporting a subset of the above-described
information.

It is noted that embodiments of the present
invention are not limited to the above-described
shapes and sizes of the substrate 12. In general,
20 the substrate 12 can have various shapes, such as
rectangular, circular, oval, or polygonal shapes,
and can have various sizes.

As indicated by block 42, the method includes
a step of writing machine-readable data to the
25 substrate. The machine-readable data, such as the
machine-readable data 16 shown in FIG. 1, provides
an instruction for linking to a resource in an
electronic network. The machine-readable data 16
can include any combination of: an instruction for
30 directing a connection to a service provider to
access the electronic network, a navigation

0 instruction for linking to the resource, and an
instruction for selecting a client routine to
display the content of the resource.

The step of writing the machine-readable data
16 to the substrate 12 can be performed in a
5 variety of ways. In some embodiments, the step of
writing the machine-readable data includes
printing the machine-readable data 16. The
machine-readable data 16 can be printed directly
onto the substrate 12, printed onto a second
10 substrate for affixing or adhering to a surface of
the substrate 12, or can be printed to a member
contained within the substrate 12. In these
embodiments, the machine-readable data 16 can
include a bar code, such as a one-dimensional or a
15 two-dimensional bar code, representative of the
navigation instructions. Examples of one-
dimensional bar codes include, but are not limited
to, 3 of 9, UPC-A, Code 128, Codabar, MSI,
Extended 3 of 9, Code 93, Extended Code 93,
20 Industrial 2 of 5, Standard 2 of 5, Code 11, and
UCC/EAN-128. Examples of two-dimensional bar
codes include, but are not limited to, Data Matrix
and PDF417.

Typically, the printed form of the machine-
25 readable data 16 is not readily interpretable or
not readily discernible by the end user 28. For
example, although a human may be specially trained
to mentally decode a bar code, such a code is
practically indiscernible by most humans.
30 Further, the machine-readable data 16 can be

0 printed to be either visible or invisible to the
 end user 28.

 In other embodiments, the step of writing the
 machine-readable data 16 includes writing the
 machine-readable data 16 to a magnetic storage
5 medium. This step can be performed by: (i)
 magnetically writing the machine-readable data 16
 to a portion of the substrate 12 having a magnetic
 storage medium; (ii) magnetically writing the
 machine-readable data 16 to a magnetic storage
10 medium for affixing to the substrate 12; or (iii)
 magnetically writing the machine-readable data to
 a magnetic storage medium contained (e.g.
 sandwiched) within the substrate 12. Here, the
 machine-readable data 16 can be written to the
15 magnetic storage medium using a magnetic write
 head or the like.

 In further embodiments, the step of writing
 the machine-readable data 16 includes writing the
 machine-readable data 16 to a memory supported by
20 the substrate 12. The machine-readable data 16 is
 communicated to the memory either via an interface
 integrated with the network navigation device, or
 via a receiver integrated with the network
 navigation device.

25 As indicated by block 44, the method further
 includes a step of writing the first human-
 viewable image 14 to the substrate. The first
 human-viewable image 14 is associated with and
 preferably indicative of the resource.

30 The first human-viewable image 14 can be
 written to the substrate 12 in a variety of ways.

0 In one embodiment, the first human-viewable images
14 is printed directly onto the substrate 12. In
another embodiment, the first human-viewable
images 14 is printed onto a second substrate for
affixing or adhering to a surface of the substrate
5 12. Here, for example, the second substrate can
have an adhesive backing for affixing the first
human-viewable image 14 to the substrate 12. As
another alternative, the first human-viewable
image 14 can be printed to a member which is
10 contained (e.g. sandwiched) within the substrate
12.

As indicated by block 46, the method
optionally includes the step of writing a second
human-viewable image to the substrate. The second
15 human-viewable image can be associated with a
service provider used to access the electronic
network, a client routine used to display the
content of the resource, a node used to link to
the resource, and/or an advertiser.

20 As indicated by block 48, the method
optionally includes a step of writing second
machine-readable data to the substrate. The
second machine-readable data provides an
instruction for linking to a second resource
25 associated with the second human-viewable image.

FIGS. 3 to 9 illustrate various examples of
embodiments of the network navigation device 10
produced using embodiments of the method described
with reference to FIG. 2. It is noted that the
30 teachings herein can be interchanged and combined

0 among the various examples to form additional
embodiments.

5 FIG. 3 is an illustration of a first network
navigation device generated in accordance with an
embodiment of the present invention. The network
navigation device includes a substrate 50 which
supports a first human-viewable image 52, a second
human-viewable image 54, and machine-readable data
56.

10 The first human-viewable image 52 includes
information which indicates to an end user that
the network navigation device can be utilized to
link to a resource from or about Motorola, Inc.
For this purpose, included in the human-viewable
image 52 is textual information such as
15 "Motorola", the "What you never thought possible"
trademark, and graphical information such as the
Motorola logo 58.

20 The second human-viewable image 54 includes a
logo which identifies a service which provides the
resource to the end user. In this embodiment, the
logo identifies a linking service provided at a
node (such as the node 24 in FIG. 1) on the World
Wide Web.

25 The machine-readable data 56 includes a bar
code representation of a first URL for the node
which provides the linking service (in particular,
<http://link.node/>), and a second URL for the
Motorola home page on the World Wide Web (in
particular, <http://mot.com>). It is noted that the
30 URL of <http://link.node/> is a fictitious URL, and
is utilized for purposes of illustration only. If

0 desired, a printed, human-viewable representation
59 of any of the machine-readable data 56 can be
supported by the substrate 50.

 The first URL provides a navigation
instruction for automatically linking the network
5 access apparatus 22 to the node 24 via the
electronic network 20. The second URL is utilized
to link the node 24 to the Motorola home page (for
example, at the electronic address 26) via the
electronic network 20. The node 24 receives
10 content from the Motorola home page upon linking
thereto. The content is transferred from the node
24 to the network access apparatus 22 via the
electronic network 20.

 Optionally, the content delivered to the
15 network access apparatus 22 can be modified at the
node 24 to include an image corresponding to at
least a portion of the second human-viewable image
54. Here, for example, the content can be
modified to include an image of the logo for the
20 linking service.

 In the embodiment illustrated in FIG. 3, the
substrate 50 has the size of a business card (3.5
inches by 2 inches). Preferably, the substrate 50
is formed entirely of a dielectric and/or
25 nonmagnetic material such as paper, cardboard, or
plastic. These materials are advantageous for
producing a network navigation device which is
inexpensive, and hence, can be disposed after use.

 The human-viewable images 52 and 54 and the
30 machine-readable data 56 can be printed directly
onto the substrate 50. Alternatively, the human-

0 viewable images 52 and 54 and the machine-readable
data 56 can be printed onto a second substrate,
which is thereafter affixed to the substrate 50.

5 FIG. 4 is an illustration of a second network
navigation device generated in accordance with an
embodiment of the present invention. The second
network navigation device includes a substrate 60
which supports a human-viewable image 62 to
10 indicate to an end user that the network
navigation device can be utilized to link to a
resource from or about Motorola, Inc. The
substrate 60 further supports machine-readable
data 64 in the form of a first bar code
representation 66 and a second bar code
15 representation 68 of a URL for the Motorola home
page (in particular, <http://mot.com>).

20 The first bar code representation 66 and the
second bar code representation 68 are disposed on
different halves of the substrate 60. Preferably,
the first bar code representation 66 is aligned
with and located proximate to a first edge 70 of
the substrate 60, while the second bar code
representation 68 is aligned with and located
proximate to a second edge 72 of the substrate 60.

25 As a result, the end user can grasp the
network navigation device from either of two sides
without obstructing at least one of the first bar
code representation 66 and the second bar code
representation 68. Further, by disposing the
human-viewable image 62 in a natural viewing
30 orientation on the substrate 60, the end user can
view an indication of the resource while grasping

0 the network navigation device from either of the
two sides. Hence, this embodiment of the network
navigation device is amenable for both right-
handed and left-handed use by the end user.

5 In the embodiment illustrated in FIG. 4, the
substrate 60 has the size of a playing card (2.5
inches by 3.5 inches). The substrate 60 is
preferably formed of a dielectric material and/or
a nonmagnetic material such as paper, cardboard,
or plastic.

10 FIG. 5 is an illustration of one surface of a
third embodiment of a network navigation device
generated in accordance with an embodiment the
present invention. The third network navigation
device includes a substrate 80 which supports a
15 human-viewable image 82 indicating that the third
network navigation device can be utilized to link
to a resource from or about Motorola, Inc. The
substrate 80 further supports machine-readable
data 84 in the form of a first bar code
20 representation 86 of a URL for the Motorola home
page (in particular, <http://mot.com>). The first
bar code representation 86 is aligned with and
located proximate to an edge 88 of the substrate
80.

25 FIG. 6 is an illustration of an opposing
surface of the third network navigation device.
At the opposing surface, the substrate 80 supports
a human-viewable image 90 which, preferably, is
the same as the human-viewable image 82. The
30 substrate 80 further supports machine-readable
data 92 in the form of a second bar code

0 representation 94 of the URL for the Motorola home
page. Preferably, the first bar code
representation 86 and the second bar code
representation 94 are identical. The second bar
code representation 94 is aligned with and located
5 proximate to the edge 88 of the substrate 80.

As a result, the end user can grasp the
network navigation device of FIGS. 5 and 6 from a
side 96 without obstructing at least one of the
first bar code representation 86 and the second
10 bar code representation 94. Hence, the third
network navigation device is amenable for both
right-handed use, using one surface, and left-
handed use, using the opposing surface.

In the embodiment illustrated in FIGS. 5 and
15 6, the substrate 80 has the size of a playing card
(2.5 inches by 3.5 inches). The substrate 80 is
preferably formed of a dielectric material and/or
a nonmagnetic material such as paper, cardboard,
or plastic.

20 The use of a printed image and printed data on
a paper, cardboard or plastic substrate, such as
in FIGS. 3 to 6, provides a number of advantages.
A first advantage is that the resulting network
navigation device can be produced inexpensively
25 for wide distribution. For example, these network
navigation devices can be: (i) included as inserts
in magazines, newspapers, or other publications;
(ii) stacked into decks and packaged for
distribution by mail or for marketing in stores;
30 and/or (iii) distributed as one distributes
business cards. A second advantage is that a user

0 can rapidly thumb through a number of network
navigation devices to find network resources of
interest by viewing the image on each network
navigation device. In addition, the network
navigation devices can be collected and traded in
5 a manner similar to trading cards.

In addition, the use of a printed image and
printed data allows for network navigation devices
to be formed on pages of a book, magazine,
newspaper, or other publication. In general, each
10 page can define a single network navigation
device, or can define a plurality of network
navigation devices. If desired, a page defining a
plurality of network navigation devices can be
perforated to allow for separation into individual
15 network navigation devices.

In one application, the printed image can
include a figure in a book or the like. Here, the
printed data may be utilized to link a user to a
resource having information associated with the
20 figure. If desired, the printed data can be
included in a caption for the figure. In another
application, a plurality of pages of network
navigation devices are assembled to form a
directory of resources in an electronic network.

25 Further, the use of a printed image and
printed data allows for network navigation devices
to be formed on packages, boxes, containers, and
the like. Here, for example, a network navigation
can be formed on a surface of a cereal box.

30 Although the embodiments of FIGS. 3 to 6
illustrate a single printed code on the network

0 navigation device, it is noted that separate
printed codes can be utilized for each of the
various types of information stored on a network
navigation device.

5 FIG. 7 illustrates a fourth network navigation
device generated in accordance with an embodiment
of the present invention. The fourth network
navigation device includes a PCMCIA memory card
100 having stored therein machine-readable data
representative of navigation instructions for
10 linking to a resource. The PCMCIA memory card 100
has a PCMCIA interface 102 for communicating the
machine-readable data to a data reader with a
mating PCMCIA interface.

15 The PCMCIA memory card 100 supports a first
externally-viewable image 104 and a second
externally-viewable image 106 at an exterior
surface 108. Hence, the substrate as described
earlier includes a portion of the housing of the
PCMCIA memory card 100.

20 In this example, the first externally-viewable
image 104 includes an image of a two-way pager
available from Motorola. The second externally-
viewable image 106 includes a logo of a service
provider, such as an internet service provider,
25 through which access to the electronic network 20
is provided.

The machine-readable data includes
instructions for connecting to the internet
service provider. The instructions for connecting
30 can include, for example, a telecommunication
number (such as a phone number) which is to be

0 dialed to access the internet service provider.
The machine-readable data can further include a
code, such as a password, for authentication by
the internet service provider. Based upon the
code, access to the resource is either allowed,
5 limited, or inhibited. Further, the code can be
utilized by the internet service provider to
uniquely identify the network navigation device.

In addition, the machine-readable data
includes a representation of the URL for
10 information on the two-way pager on the World Wide
Web, which is [http://www.mot.com/
MIMS/MSPG/Products/Two-way/tango/](http://www.mot.com/MIMS/MSPG/Products/Two-way/tango/). The internet
service provider utilizes the URL to link the end
user 28 to the resource to receive information on
15 the two-way pager.

FIG. 8 illustrates a fifth network navigation
device generated in accordance with an embodiment
of the present invention. The network navigation
device includes a substrate 110 which supports a
20 magnetic storage medium 112. In the example of
FIG. 8, the magnetic storage medium 112 has the
form of a magnetic stripe, although alternative
forms can be utilized. The magnetic storage
medium 112 stores machine-readable data providing
25 navigation instructions for linking to a resource.
The machine-readable data is communicated to a
data reader having a magnetic reading head, such
as a magnetic stripe reader.

The substrate 110 supports a human-viewable
30 image 114 indicative of a resource, such as a
resource for a Motorola modem. Accordingly, the

0 magnetic storage medium 112 can store a
representation of the URL for obtaining
information on the Motorola modem, which is
[http://www.mot.com/
MIMS/ISG/Products/bit-surfr_pro/](http://www.mot.com/MIMS/ISG/Products/bit-surfr_pro/).

5 In the embodiment illustrated in FIG. 8, the
substrate 110 has the size of a credit card (3.375
inches by 2.25 inches). Preferably, the substrate
110 is formed of a dielectric and/or nonmagnetic
material such as paper, cardboard, or plastic.
10 Here, magnetic material in the network navigation
device is within the magnetic storage medium 112.

FIG. 9 illustrates a sixth network navigation
device generated in accordance with an embodiment
of the present invention. The sixth network
15 navigation device includes a radio frequency tag
120 containing navigation instructions for
accessing a resource. The radio frequency tag 120
includes a memory containing data representative
of the navigation instructions, and a transmitter
20 which transmits a signal representative of the
data for external reception. The memory can be
either read-only or read-write. In general, the
radio frequency tag 120 can be either active (i.e.
having an internal battery for powering its
25 circuits) or passive (i.e. powering its circuits
using externally-generated power).

Various commercially-available radio frequency
tags can be utilized for the radio frequency tag
120, including but not limited to, tags produced
30 by Indala Corporation and the MicroStamp RIC
(Remote Intelligent Communication) tags available

0 from Micron Communications, Inc. Illustrated in
FIG. 9 is a network navigation device based on the
MicroStamp RIC unit, which is postage-stamp sized
(1.25 inches by 1.25 inches).

5 A human-viewable image 122 is supported by an
exterior surface of the radio frequency tag 120.
Hence, the substrate as described earlier includes
a portion of the housing of the radio frequency
tag 120. In this example, the human-viewable
10 image 122 includes the Motorola logo, which
indicates that the navigation instructions will
link a user to a resource which provides
information related to Motorola, Inc.

In this embodiment, the machine-readable data
includes an electronic address for linking to a
15 node (such as the node 24 in FIG. 1), and a code
which identifies the resource to the node. The
code is utilized so that the electronic address
for the resource is concealed from end users. The
node converts the code to an electronic address
20 for the resource, links to the electronic address,
and communicates content of the resource to the
end user 28.

The machine-readable data further includes an
instruction which initiates the execution of a
25 predetermined Web browser for displaying the
content of the resource. A logo for the
predetermined Web browser is included in a second
human-viewable image 124 supported by the exterior
surface of the radio frequency tag 120.

30 FIG. 10 illustrates an example of a network
access apparatus and examples of various data

0 readers for reading machine-readable data from a
network navigation device. In this example, the
network access apparatus includes a personal
computer 130 having an input interface, such as a
5 keyboard 132, and a display device, such as a
monitor 134, coupled thereto.

The personal computer 130 communicates with an
electronic network via a line 136, which can
include a telephone line, an ISDN line, a coaxial
line, a cable television line, a fiber optic line,
10 a computer network line, or the like.
Alternatively, the personal computer 130 can
wirelessly communicate with the electronic
network. Based on the mode of communication with
the electronic network, the personal computer 130
15 can include a modem and/or a transceiver to
communicate with the electronic network. The
electronic network can be provided by an online
service, an Internet service provider, a local
area network service, a wide area network service,
20 a cable television service, a wireless data
service, an intranet, or the like.

The various data readers coupled to the
personal computer 130 include a bar code reader
138, an RF tag reader 140, a PCMCIA card reader
25 142, and a magnetic stripe reader 144. The bar
code reader 138 is utilized to read bar-coded
navigation instructions from a network navigation
device, such as those illustrated in FIGS. 3 to 6.
The RF tag reader 140 is utilized to receive and
30 decode an electromagnetic signal representative of
the navigation instructions generated by an RF

0 tag, such as one illustrated in FIG. 9. The
PCMCIA card reader 142 interfaces with a PCMCIA
card, such as one illustrated in FIG. 7, to read
navigation instructions stored therein. The
5 magnetic stripe reader 144 reads magnetically-
stored navigation instructions stored by a
magnetic stripe, such as one illustrated in FIG.
8.

It is noted that the bar code reader 138 is
illustrative of any optical reading device which
10 can be utilized. Similarly, the PCMCIA card
reader 142 is illustrative of any memory card
reader which can be utilized, and the magnetic
stripe reader 144 is illustrative of any magnetic
reading device which can be utilized.

15 FIG. 11 is a flow chart of an embodiment of a
method of linking to a resource in an electronic
network. The method can be utilized by the
network access apparatus 22 in FIG. 1 to
automatically link the end user 28 to a resource
20 encoded on the network navigation device 10.
Typically, the end user 28 selects a desired
resource to visit based upon the first human-
viewable image 14 associated therewith on the
network navigation device 10.

25 As indicated by block 150, the method includes
a step of reading machine-readable data from a
network navigation device. The machine-readable
data is read using the data reader 30. The
specific type of data reader utilized is selected
30 based upon how the machine-readable data is stored
on the network navigation device.

0 As indicated by block 152, a step of decoding
the machine-readable data is performed to generate
navigation instructions. The navigation
instructions tell the network access apparatus 22
how to link to the resource. As described
5 earlier, the navigation instructions can include
at least a portion of a URL or at least a portion
of an IP address for the resource. If a partial
address is received, an additional step of
10 completing the electronic address can be
performed. For example, if an IP address is
received, the IP address can be prepended by
"http://".

 Optionally, a step of storing the navigation
instructions is performed as indicated by block
15 154. The navigation instructions can be stored as
a bookmark or stored in a favorites list, such as
those available in many Web browsers, to provide a
shortcut to the electronic address. Thereafter, a
user can link to the resource by selecting the
20 shortcut rather than having to re-read the
navigation instructions from the network
navigation device.

 Preferably, a representation of the first
human-viewable image 14 is stored to provide an
25 iconic representation for the shortcut to the
resource. As a result, the association between
the first human-viewable image 14 and the resource
is reinforced. Similarly, a representation of the
second human-viewable image 18 can be stored for
30 display with the iconic representation. This
further reinforces the association between the

0 second human-viewable image 18 and a service which provides the resource.

 To facilitate storing a representation of the human-viewable images 14 and 18, the machine-readable data can include machine-readable data
5 representative of the human-viewable images 14 and 18 read in step 150. Alternatively, the human-viewable images 14 and 18 can be optically scanned into the network access apparatus 22 using a page scanner or the like. As another alternative, an
10 electronic representation of the first human-viewable image 14 can be downloaded from the resource, and an electronic representation of the second human-viewable image 18 can be downloaded from the service upon linking thereto.

15 As indicated by block 156, a step of executing a predetermined network access routine is performed. The step of executing the predetermined network access routine can include any of: (i) executing a routine to connect and/or
20 to logon to a service provider (e.g. executing a dial-up routine or a wireless authentication routine to connect to a service provider); and (ii) executing a client routine for subsequent user interaction with the electronic address (e.g.
25 executing a graphical user interface routine or a Web browsing routine).

 The step of executing the predetermined network access routine can be executed prior to reading the machine-readable data in block 150.
30 Alternatively, the predetermined network access routine can be automatically initiated upon

0 reading the machine-readable data in block 110.
Here, the machine-readable data 16 can include
instructions for directing the initiation of the
predetermined network access routine, and for
directing which predetermined network access
5 routine is to be executed.

In particular, the machine-readable data 16
can include instructions for directing the type
and the specifics of the connection to be made to
the electronic network 20. These instructions can
10 dictate whether a wireline connection or a
wireless connection should be made, and/or which
wireline connection or which wireless connection
should be made. As a result, the instructions on
one network navigation device may direct a
15 connection to a first service provider (e.g.
America Online) while the instructions on another
network navigation device direct a connection to a
second service provider (e.g. CompuServe).

Further, the machine-readable data 16 can
20 include instructions for selecting which client
routine is to be executed. As a result, the
instructions on one network navigation device may
direct that a first graphical user interface
routine (e.g. Netscape Navigator) be executed,
25 while the instructions on another network
navigation device direct a that second graphical
user interface routine (e.g. Microsoft Internet
Explorer) be executed.

As indicated by block 158, the method includes
30 a step of linking to the resource using the
navigation instructions. This step typically

0 includes transmitting the navigation instructions
to the electronic network 20 to establish the link
to the resource.

As indicated by block 160, the method includes
a step of receiving content from the resource once
5 the link is established. The content from the
resource can include audible information and/or
visual information, such as graphical information
and/or textual information. Examples of the
content include, but are not limited to, any
10 combination of a file from a local hard drive, a
file from a FTP server, an HTML document, content
from a Gopher server, a message from a newsgroup,
a transmission from a Telnet session, a
transmission from a WAIS server, an animation
15 file, a movie file, an audio file, downloadable
software, and an electronic book file.

The content can also have the form of a
videotelephone call with an individual. Here, for
example, the first human-viewable image 14 can
20 include a picture and/or a name of the individual,
and the machine-readable data can include a
telecommunication number or an electronic address
for communicating with the individual.

As indicated by block 162, the method includes
25 a step of displaying the content from the
resource. The content can be displayed on the
display device 32 or the hard copy device 38. As
described earlier, the content can include an
image which corresponds to at least a portion of
30 the first human-viewable image 14 on the network
navigation device 10. Additionally, the content

0 can include an image which corresponds to at least
a portion of the second human-viewable image 18.

 As indicated by block 164, the method
optionally includes a step of receiving a user-
initiated event associated with a print request.
5 The user-initiated event can include, for example,
a step of receiving a print command issued by the
end user 28 within the client routine.

 As indicated by block 166, the method
optionally includes a step of producing another
10 network navigation device in response to receiving
the user-initiated event. In general, this
network navigation device is produced in
accordance with any of the embodiments of the
method described with reference to FIG. 2. Of
15 particular interest, however, is the case in which
machine-readable data for linking to the resource
and any human-viewable images are printed onto a
substrate using a hard copy device. Here, in an
exemplary embodiment, the content of the resource
20 is printed to one or more pages of printing
material, such as paper, cardboard, or plastic.
The machine-readable data is printed to at least
one of the one or more pages, and preferably, to
each of the one or more pages.

25 An article of manufacture can be formed to
direct a network access apparatus to perform the
above-described steps. The article of manufacture
can include a computer-readable storage medium
having computer-readable data stored therein which
30 directs the network access apparatus to perform
the above-described steps. Examples of the

0 computer-readable storage medium include, but are
not limited to, a logic circuit, a memory, a mass
storage medium, an optical disk, a CD-ROM, a
magnetic disk, a floppy disk, a hard disk, and a
PCMCIA card.

5 FIG. 12 illustrates an example display of
content of a resource using the network navigation
device of FIG. 3. The display includes content
170 from the resource, which includes an image 172
corresponding to the first human-viewable image
10 42. The display further includes content 174
added by the linking service. The content 174
includes an image 176 corresponding to the second
human-viewable image 44.

15 FIG. 13 illustrates an example of a step of
receiving a user-initiated event associated with a
print request. This example continues with the
example display of FIG. 12. The user-initiated
event includes pointing a cursor 180 to a print
hot spot 182 on the display, and clicking on the
20 print hot spot 182. It is noted that the print
hot spot 182 can be located at an icon indicative
of the print command rather than within a pull-
down menu 184 as illustrated. Alternatively, the
print command can be issued by a user-initiated
25 event received via a keyboard. Here, for example,
the print command can be issued by the end user
depressing "ALT-p" using the keyboard.

FIG. 14 illustrates an example of a hard copy
output produced in response to receiving the print
30 command. The hard copy output is produced on a

0 sheet 188 of material, such as paper, cardboard,
or plastic, using the hard copy device 38.

The hard copy output includes the content 170
from the resource and optionally the content 174
added by the linking service. The hard copy
5 output further includes machine-readable data 190
for linking to the resource. The machine-readable
data 190 allows the end user or another user to
quickly re-link to the resource using the hard
copy output.

10 The machine-readable data 190 has the form of
printed data, such as a one-dimensional or a two-
dimensional bar code. Although the machine-
readable data 190 can be located anywhere on the
sheet 188, it is preferred that the machine-
15 readable data 190 be printed near any peripheral
edge 192 of the sheet 188. More preferably, the
machine-readable data 190 is printed in either a
header 194 or a footer 196 of the sheet 188. In
the embodiment illustrated in FIG. 13, the
20 machine-readable data 190 is printed on a left
side of the footer 196.

Additional information can also be printed in
the header 194 and the footer 196 of the sheet
188. The additional information can include a
25 human-viewable form 198 of the electronic address,
a page number 200 for the sheet 188, a date 202
and a time (not illustrated) at which the resource
was visited or the hard copy output was printed.

It is noted that, in this example, the
30 resource can be initially visited by the end user

0 28 with or without the use of a network navigation device in accordance with the present invention.

FIG. 15 is a flow chart of an embodiment of a method of producing a network navigation device based on a browsing history of the end user 28.

5 As indicated by block 210, the method includes a step of browsing at least one resource in the electronic network 20. The at least one resource can be browsed by the end user 28 with or without the use of a network navigation device in
10 accordance with the present invention. Typically, the at least one resource includes a plurality of resources.

As indicated by block 212, the method includes a step of recording a browsing history of the at
15 least one resource in the electronic network 20. The step of recording the browsing history can include any of: recording an electronic address for each of the at least one resource, recording a respective image included in the content of each
20 resource, recording a sequence in which the at least one resource was browsed, and recording a hierarchy of the at least one resource in the electronic network 20. The browsing history can be recorded in a storage device associated with
25 either the network access apparatus 22 or the electronic network 20.

As indicated by block 214, the method includes a step of producing a network navigation device for the at least one resource. The step of
30 producing the network navigation device can be

0 performed using any embodiment of the method
described with reference to FIG. 2.

The network navigation device is produced
using the respective image and a machine-readable
form of the electronic address for each of the at
5 least one resource in the browsing history. The
images and the machine-readable data produced
thereby can be formatted in accordance with the
sequence in which the at least one resource was
browsed, or in accordance with the hierarchy of
10 the at least one resource in the electronic
network.

FIG. 16 is an illustration of a first
embodiment of a network navigation device for a
plurality of resources. The network navigation
15 device is produced on a sheet 220 of material,
such as paper, plastic, or cardboard, using a hard
copy device.

For each of the plurality of resources, the
network navigation device includes a human-
20 viewable image 222 and machine-readable data 224.
Each human-viewable image 222 indicates its
respective resource to the end user 28, while each
machine-readable data 224 provides an instruction
to link to the resource. Each machine-readable
25 data 224 has the form of printed data, such as a
one-dimensional or a two-dimensional bar code.
The human-viewable image 222 and the machine-
readable data 224 for the plurality of resources
may be arranged sequentially in accordance with a
30 sequence in which the plurality of resources was
visited.

0 Optionally, the network navigation device
includes: (i) a human-viewable image 226
associated with a service provider; (ii) a human-
viewable image 228 associated with a client
5 routine; (iii) a human-viewable image 230
associated with a node in the electronic network;
and (iv) a human-viewable image 232 associated
with an advertiser. As illustrated, each of the
human-viewable images 226, 228, 230, and 232 can
10 include a respective logo or the like. The
service provider, the client routine, and the node
can be those utilized to browse the plurality of
resources, or can be others which may be utilized
in a subsequent browsing session.

 Proximate to the human-viewable image 226 is
15 machine-readable data 234 associated with the
service provider. The machine-readable data 234
can provide instructions to connect and/or to
logon to the service provider. Alternatively, the
machine-readable data 234 can provide an
20 instruction for linking to a resource which
provides information regarding the service
provider.

 Proximate to the human-viewable image 228 is
machine-readable data 236 associated with the
25 client routine. The machine-readable data 236 can
provide instructions for executing the client
routine, for downloading the client routine from
the electronic network 20, or for obtaining
information about the client routine from the
30 electronic network 20.

0 Proximate to the human-viewable image 230 is machine-readable data 238 associated with the node in the electronic network. The machine-readable data 238 can provide instructions for linking to the node, for example.

5 Proximate to the human-viewable image 232 is machine-readable data 240 associated with the advertiser. The machine-readable data can provide instructions for linking to a resource associated with the advertiser.

10 Preferably, each item of the machine-readable data 234, 236, 238, and 240 has the form of printed data, such as a one-dimensional or a two-dimensional bar code.

15 Additional information can also be printed on the sheet 220, such as a date 242 and a time 244 at which the plurality of resources was visited or the network navigation device was produced.

20 FIG. 17 is an illustration of a second embodiment of a network navigation device for a plurality of resources. The network navigation device is produced on a sheet 250 of material, such as paper, plastic, or cardboard, using a hard copy device.

25 For each of the plurality of resources, the network navigation device includes a human-viewable image 252 and machine-readable data 254, such as the human-viewable image 222 and the machine-readable data 224 described with reference to FIG. 16. The human-viewable image 252 and the
30 machine-readable data 254 for the plurality of resources are arranged hierarchically in

0 accordance with the hierarchy of the plurality of
resources in the electronic network 20. For
example, a resource represented by reference
numeral 256 can be a home page having hyperlinks
5 to resources represented by reference numerals
258, 260, and 262. The resource represented by
reference numeral 258 has hyperlinks to resources
represented by reference numerals 264 and 266.
The resource represented by reference numeral 262
10 has a hyperlink to a resource indicated by
reference numeral 268.

The network navigation device optionally
includes human-viewable images 270, 272, 274, and
276, such as the human-viewable images 226, 228,
230, and 232 described with reference to FIG. 16.
15 Further, the network navigation device can
optionally include machine-readable data 278, 280,
282, and 284, such as the machine-readable data
234, 236, 238, and 240 described with reference to
FIG. 16. Still further, the network navigation
20 device can include additional information such as
a date 286 and a time 288 at which the plurality
of resources was visited or the network navigation
device was produced.

FIG. 18 is an illustration of a third
25 embodiment of a network navigation device for a
plurality of resources. The network navigation
device is produced on a sheet 290 of material,
such as paper, plastic, or cardboard, using a hard
copy device.

30 For each of the plurality of resources, the
network navigation device includes a human-

0 viewable image 292 and machine-readable data 294,
 such as the human-viewable image 222 and the
 machine-readable data 224 described with reference
 to FIG. 16. The human-viewable image 292 and the
5 machine-readable data 294 for the plurality of
 resources are printed to appear in perspective
 views. For example, each human-viewable image 292
 and machine-readable data 294 can appear within a
 perspective view of a respective card 296. To
10 provide a sense of depth, a respective shadow 298
 can be printed for each respective card 296.

 FIG. 19 is a flow chart of an embodiment of a
 method of producing a network navigation device.
 The method can be initiated either at the premises
 of the end user 28 or at a node in the electronic
15 network 20.

 As indicated by block 300, the method includes
 a step of initiating a search of the electronic
 network 20. The step of initiating the search is
 performed to locate resources in the electronic
20 network 20. The search can be initiated by a
 human, such as the end user 28, or can be
 autonomously initiated by either the network
 access apparatus 22 or a node in the electronic
 network 20 (such as the node 24). The resources
25 to be located can be known or unknown to the
 initiator of the search at the time of initiating
 the search. The search can be performed using any
 of the following: (i) a search engine; (ii) a
 software agent; (iii) a software robot; (iv) a
30 network worm; (v) a network spider; or (vi) a
 network crawler.

0 As indicated by block 302, the method includes
a step of locating at least one resource in the
electronic network 28 as a result of the search.
Each of the at least one resource can be
identified by an electronic address therefor.
5 Typically, the step of locating at least one
resource results in locating a plurality of
resources in the electronic network 28.

 As indicated by block 304, the method includes
a step of retrieving content from each of the at
10 least one resource. Preferably, the content from
each of the at least one resource includes a
human-viewable image indicative of the resource.

 As indicated by block 306, the method includes
a step of producing at least one network
15 navigation device for the at least one resource.
The at least one network navigation device is
produced in accordance with any embodiment of the
method described with reference to FIG. 2. Each
network navigation device is produced using a
20 machine-readable form of the electronic address
for a respective resource, and the human-viewable
image included in the content of the respective
resource. In general, each network navigation
device can be associated with a single resource
25 (as in the examples of FIGS. 3 to 9 and FIG. 14)
or with a plurality of resources (as in the
examples of FIGS. 16 to 18).

 To track changes in the content of the at
least one resource, flow of the method is directed
30 back to block 304. The at least one resource is
retrieved to determine if any changes have

0 occurred in the content or in the electronic
address. If so, then subsequent network
navigation devices produced in block 306 utilize a
modified human-viewable image and/or modified
machine-readable data for the resource.

5 FIG. 20 is a block diagram of an embodiment of
a system for producing a network navigation
device. The system includes a processing
apparatus 310, a computer-readable storage medium
312, and at least one output device 314. The
10 computer-readable storage medium 312 stores
computer-readable data to direct the processing
apparatus 310 to produce the network navigation
device. The computer-readable data is utilized by
the processing apparatus 310 to direct the at
15 least one output device 314 to write machine-
readable data to a substrate and to write a first
human-viewable image to the substrate. The
machine-readable data provides an instruction for
linking to a resource in an electronic network,
20 and the first human-viewable image provides an
association with the resource. The above-
described system can be further utilized to
perform any additional steps described herein for
producing the network navigation device.

25 Examples of the processing apparatus 310
include, but are not limited to: (i) embodiments
of the network access apparatus 22 described
herein; (ii) a general purpose computer; and (iii)
a server on a node in the electronic network. The
30 processing apparatus 310 can be located proximate

0 to the end user 28 or the node in the electronic
network 20.

 Examples of the computer-readable storage
medium 312 include, but are not limited to, a
logic circuit, a memory, a mass storage medium, an
5 optical disk, a CD-ROM, a magnetic disk, a floppy
disk, a hard disk, and a PCMCIA card. The
computer-readable storage medium 312 can be
located at the premises of the end user 28, at the
premises of the node in the electronic network 20,
10 or elsewhere. If located at the node, the
computer-readable data stored by the computer-
readable storage medium 312 can be downloaded to
end users via the electronic network 20.

 Further, the computer-readable storage medium
15 312 can include computer-readable data which
provides additional software, such as a client
program, a browser program, a word processing
program, or a desktop publishing program, for
initiating or assisting in the production of the
20 network navigation device.

 Examples of the at least one output device 314
include any combination of one or more of: (i) a
hard copy output device, such as any of the
examples of the hard copy device 38 described
25 herein; (ii) magnetic data writer, such as a
magnetic stripe writer; (iii) an RF tag writer;
and (iv) a memory writer, such as a PCMCIA card
writer. The at least one output device 314 can be
located at the premises of the end user 28, at the
30 premises of the node in the electronic network 20,
or elsewhere.

0 In general, the above-described system can be
utilized to produce a network navigation device,
or by a service at the node to produce network
navigation devices. If located at different
premises, the processing apparatus 310, the
5 computer-readable storage medium 312, and the at
least one output device 314 can communicate via
the electronic network 20 to produce the network
navigation device.

10 FIG. 21 illustrates an embodiment of a
substrate for use in forming a network navigation
device. The substrate includes a sheet of
material 320. The sheet of material 320 can be
formed of paper, plastic, cardboard, or other
printing material. The sheet of material 320 can
15 be sized in accordance with a standard size of
printing material, or can have a custom size.

20 The substrate includes a first plurality of
concertina folds 322 and a second plurality of
concertina folds 324. The first plurality of
concertina folds 322 is oriented transverse to,
and preferably perpendicular to, the second
plurality of concertina folds 324. It is also
preferred that the first plurality of concertina
folds 322 consists of an even number of folds, and
25 that the second plurality of concertina folds 324
consists of an even number of folds. In an
exemplary embodiment, the first plurality of
concertina folds 322 consists of two folds and the
second plurality of concertina folds 324 consists
30 of two folds.

0 The first and second plurality of concertina
folds 322 and 324 divide the sheet of material 320
into a plurality of segments. The plurality of
segments includes a first corner segment 326 and a
second corner segment 328. The first corner
5 segment 326 is diagonally opposite to the second
corner segment 328.

 A first tab 330 is disposed at the first
corner segment 326 and a second tab 332 is
disposed at the second corner segment 328. The
10 first tab 330 and the second tab 332 may be
grasped by a user to fold or to unfold the
substrate.

 Typically, the first tab 330 and the second
tab 332 are smaller than the first corner segment
15 326 and the second corner segment 328. The first
tab 330 and the second tab 332 can be formed of
the same material as the sheet of material 320, or
can be formed using a different material.
Further, the first tab 330 and the second tab 332
20 can have the same thickness and/or the same
stiffness as the sheet of material 320. The first
tab 330 and the second tab 332 can be integrated
into the form of the sheet of material 320, or can
be attached to the sheet of material 320 after the
25 sheet of material 320 has been formed.

 FIG. 22 is an illustration of the substrate of
FIG. 21 in a first partially-folded state. The
first partially-folded state is attained as the
user begins to move at least one of the first tab
30 330 and the second tab 332 substantially parallel
to a first axis 334. The first axis 334 is

0 transverse to, and preferably perpendicular to,
the orientation of the first plurality of
concertina folds 322. As illustrated, the
substrate folds along the first plurality of
concertina folds 322 in the first partially-folded
5 state.

FIG. 23 is an illustration of the substrate of
FIG. 21 in a second partially-folded state. The
second partially-folded state is attained as the
user continues to move at least one of the first
10 tab 330 and the second tab 332 along a path
substantially parallel to the first axis 334. As
illustrated, the substrate is completely folded
along the first plurality of concertina folds 322
in the second partially-folded state.

15 FIG. 24 is an illustration of the substrate of
FIG. 21 in a third partially-folded state. The
third partially-folded state is attained as the
user begins to move at least one of the first tab
330 and the second tab 332 substantially parallel
20 to a second axis 336. The second axis 336 is
transverse to, and preferably perpendicular to,
the second plurality of concertina folds 324. As
illustrated, the substrate folds along the second
plurality of concertina folds 324 in the third
25 partially-folded state.

FIG. 25 is an illustration of the substrate of
FIG. 21 in a completely-folded state. The
completely-folded state is attained as the user
continues to move at least one of the first tab
30 330 and the second tab 332 along a path parallel
to the second axis 336. As illustrated, the

0 substrate is completely folded along the second
plurality of concertina folds 324, as well as
along the first plurality of concertina folds 322,
in the completely-folded state.

5 The user can unfold the substrate by reversing
the process described with reference to FIGS. 21
to 25. Specifically, the substrate is unfolded
by, firstly, moving at least one of the first tab
330 and the second tab 332 apart along the second
axis 336, and secondly, moving at least one of the
10 first tab 330 and the second tab 332 apart along
the first axis 334.

Embodiments of the above-described substrate
can support any combination of the human-viewable
images and machine-readable data described herein
15 to provide a network navigation device. Further,
the substrate can support supplementary
information, such as human-readable information
describing how to use the network navigation
device and/or human-readable information
20 describing the resources which can be accessed
using the network navigation device. Also, the
substrate can provide space for printing a summary
of a navigation session using the hard copy device
38 in FIG. 1.

25 Thus, there has been described several
embodiments, including preferred embodiments, of a
method, system, and article of manufacture for
producing a network navigation device.

Because the various embodiments of the present
30 invention generate a device having a human-
viewable image which is associated with a resource

0 at an electronic address and having machine-readable data for linking to the electronic address, they provide a significant improvement in that the addressing format and the address itself become more transparent to the end user.

5 Consequently, the problem of address complexity using embodiments of the network navigation device and the importance of reserving desired domain names is reduced.

10 Additionally, the various embodiments of the present invention as herein-described provide methods and systems for an end user to produce a network navigation device. The methods can be utilized by the end user within a document browser software program, a word processor program, or a
15 desktop publishing program, for example, to produce the network navigation device.

Further, the various embodiments of the present invention provide methods and systems for an automated service to produce network navigation
20 devices.

It will be apparent to those skilled in the art that the disclosed invention may be modified in numerous ways and may assume many embodiments other than the preferred forms specifically set
25 out and described above.

Accordingly, it is intended by the appended claims to cover all modifications of the invention which fall within the true spirit and scope of the invention.

30 What is claimed is:

0

Claims

1. A method of producing a network navigation device, the method comprising the steps of:

5

writing machine-readable data to a substrate, the machine-readable data providing at least one instruction for linking to a resource in an electronic network; and

10

writing a first human-viewable image to the substrate, the first human-viewable image associated with the resource.

15

2. The method of claim 1 further comprising at least one of the steps of recording a browsing history of at least one resource in the electronic network, wherein the at least one resource is associated with the machine-readable data and the first human-viewable image; initiating a search of the electronic network; locating at least one resource in the electronic network, wherein the at least one resource includes the resource for which the machine-readable data and the first human-viewable image are written; and receiving a user-initiated event, wherein the steps of writing the machine-readable data and writing the first human-viewable image are performed in response to receiving the user-initiated event.

20

25

30

3. The method of claim 1 wherein at least a portion of the first human-viewable image

0 corresponds to an image viewable upon linking to
the resource.

4. The method of claim 1 wherein the step of
writing the first human-viewable image includes
5 printing the first human-viewable image onto the
substrate or printing content of the resource onto
the substrate.

5. The method of claim 1 wherein the
10 machine-readable data includes at least one of an
electronic address for the resource, at least a
portion of a uniform resource locator for the
resource, and at least a portion of an internet
protocol address for the resource.

15 6. The method of claim 1 wherein the
machine-readable data includes a bar code.

7. The method of claim 1 wherein the step of
20 writing the machine-readable data includes writing
the machine-readable data to a magnetic storage
medium supported by the substrate or writing the
machine-readable data to a memory supported by the
substrate.

25 8. The method of claim 7 wherein the substrate
includes a portion of a housing of a memory card
or a radio frequency tag, and wherein the machine-
readable data includes an instruction for
30 directing an initiation of a network access
routine.

0

9. A system for producing a network navigation device, the system comprising:

5

a processing apparatus which directs at least one output device to write machine-readable data to a substrate and to write a first human-viewable image to the substrate, wherein the machine-readable data provides at least one instruction for linking to a resource in an electronic network, and wherein the first human-viewable image is associated with the resource.

10

10. An article of manufacture for producing a network navigation device, the article of manufacture comprising:

15

a computer-readable storage medium; and computer readable data stored by the computer-readable storage medium, the computer-readable data utilized by a processing apparatus to direct at least one output device to write machine-readable data to a substrate and to write a first human-viewable image to the substrate, the machine-readable data providing at least one instruction for linking to a resource in an electronic network, the first human-viewable image being associated with the resource.

20

25

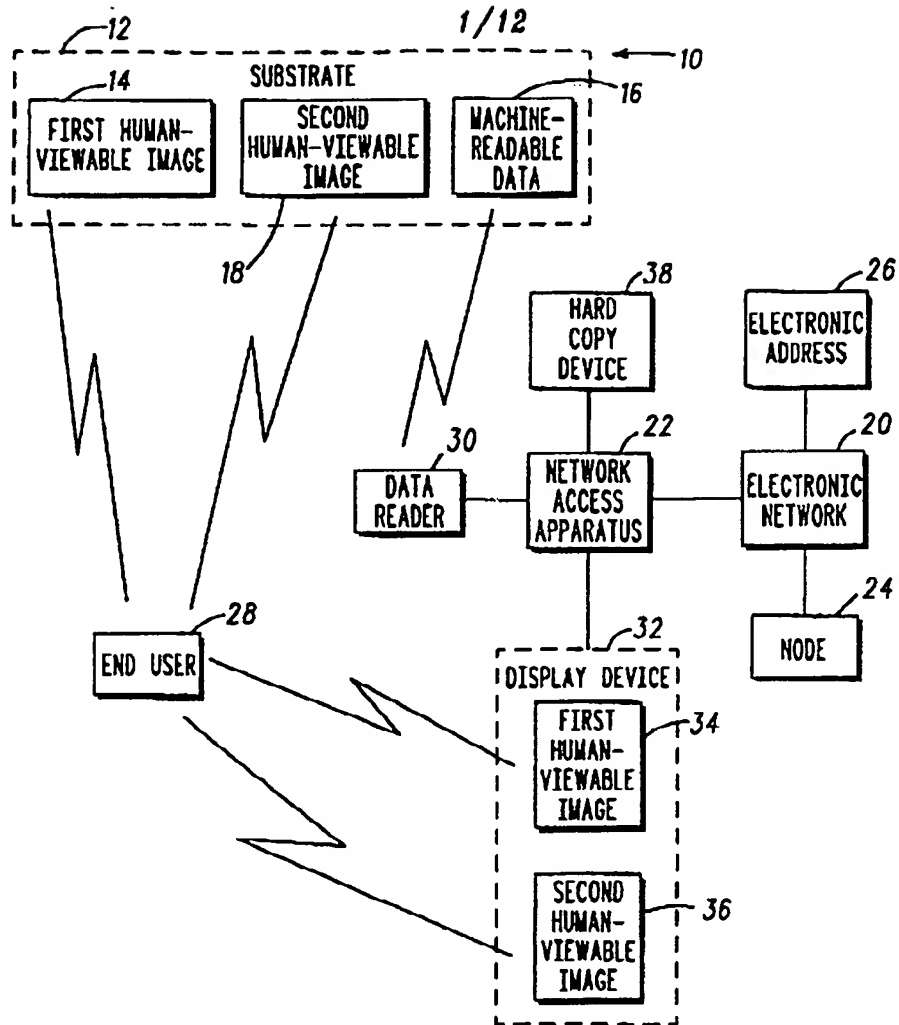


FIG. 1

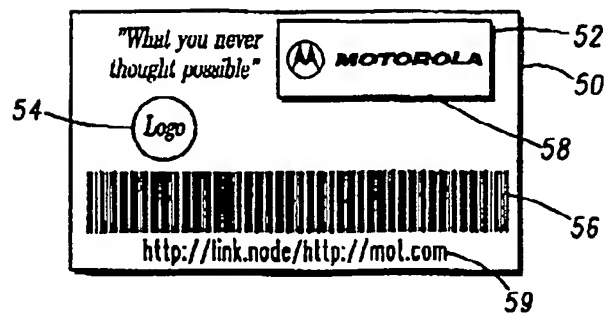


FIG. 3

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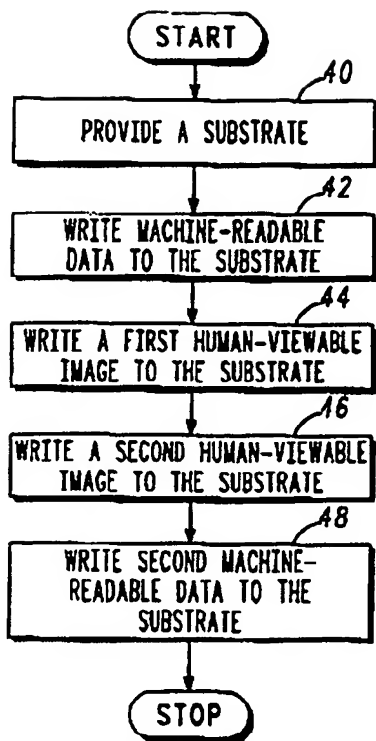


FIG.2

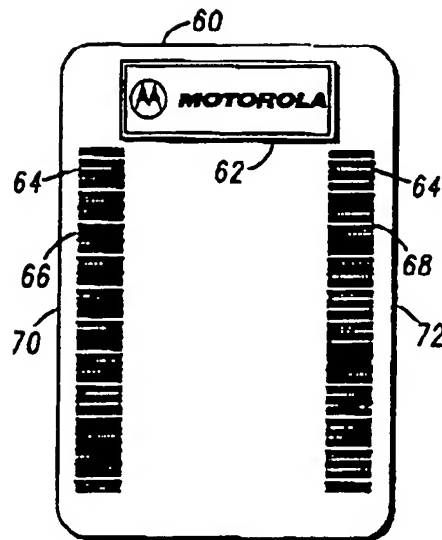


FIG.4

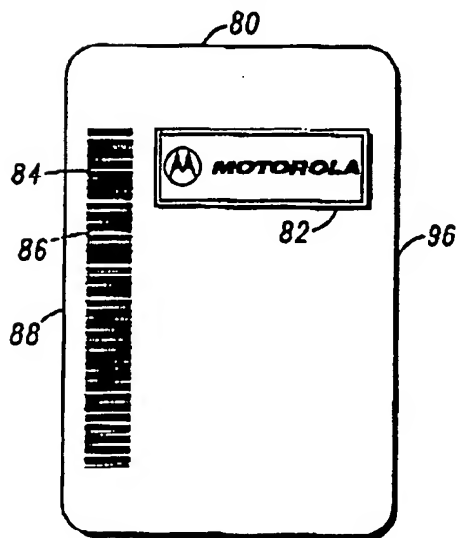


FIG.5

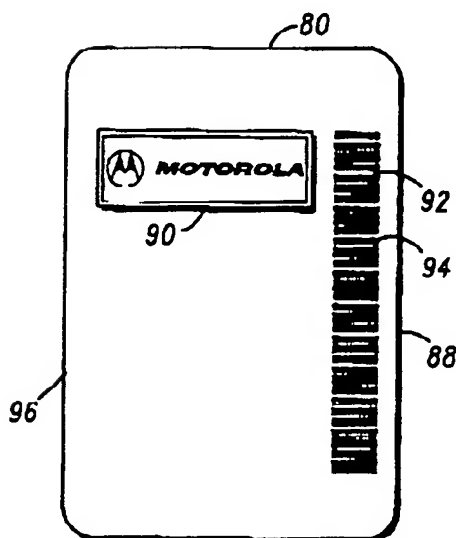


FIG.6

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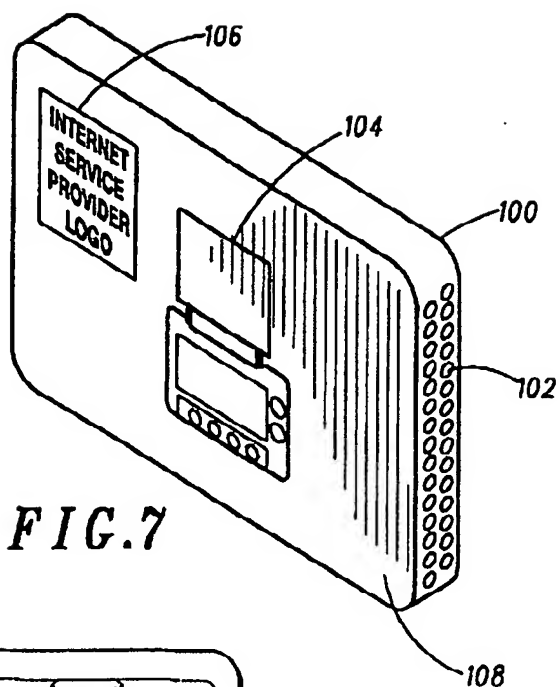


FIG. 7

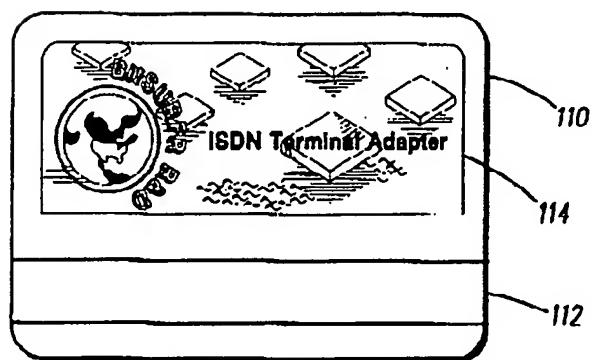


FIG. 8

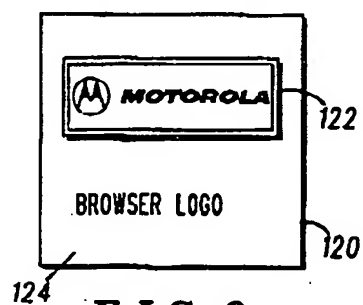
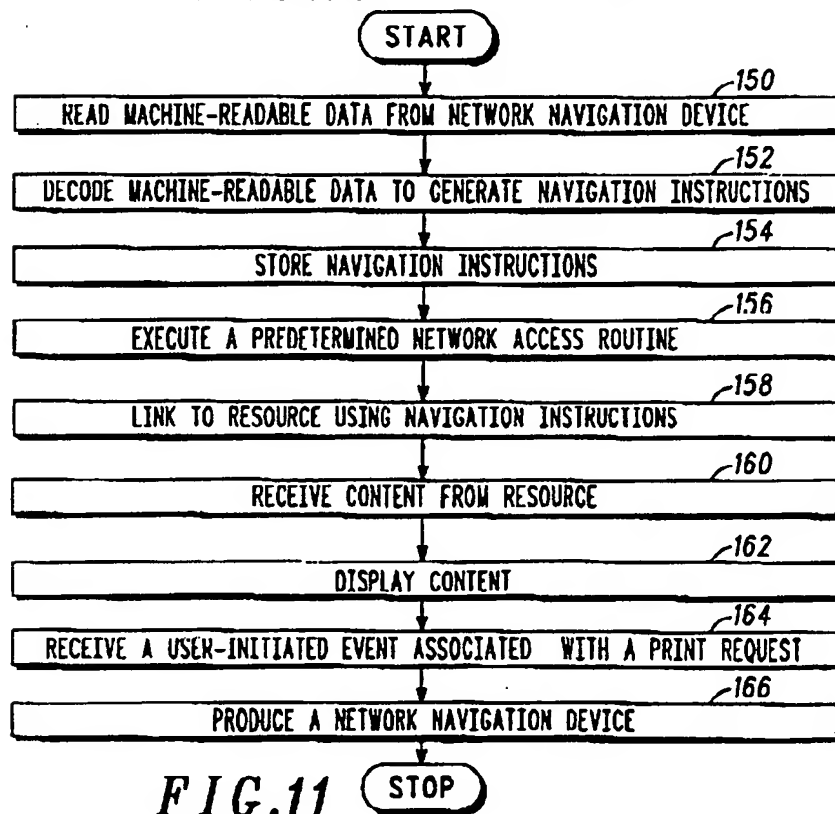
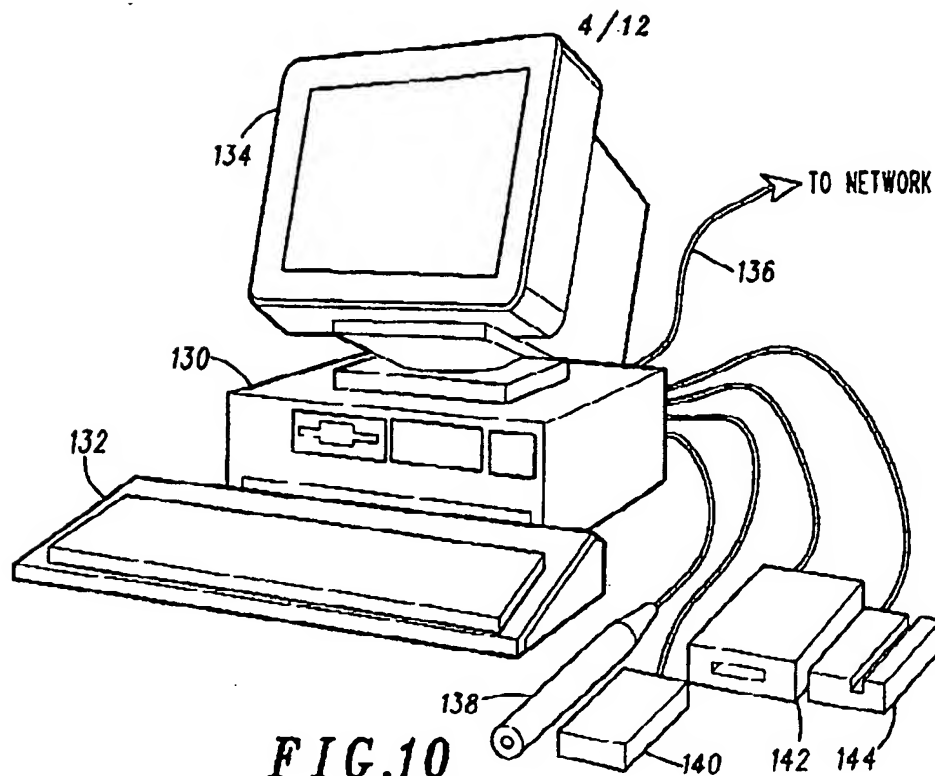


FIG. 9



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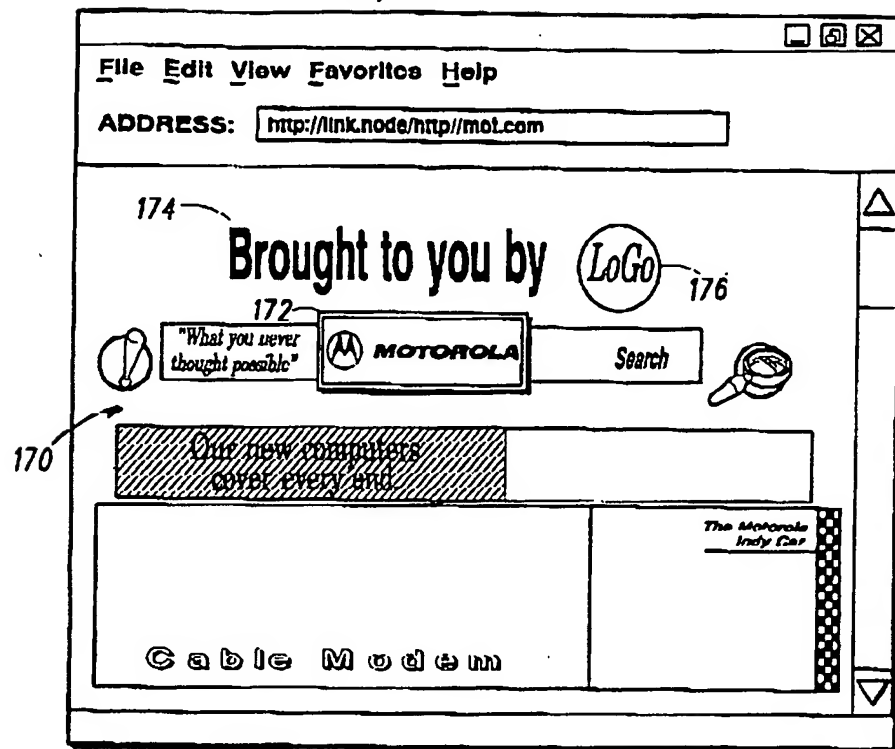


FIG. 12

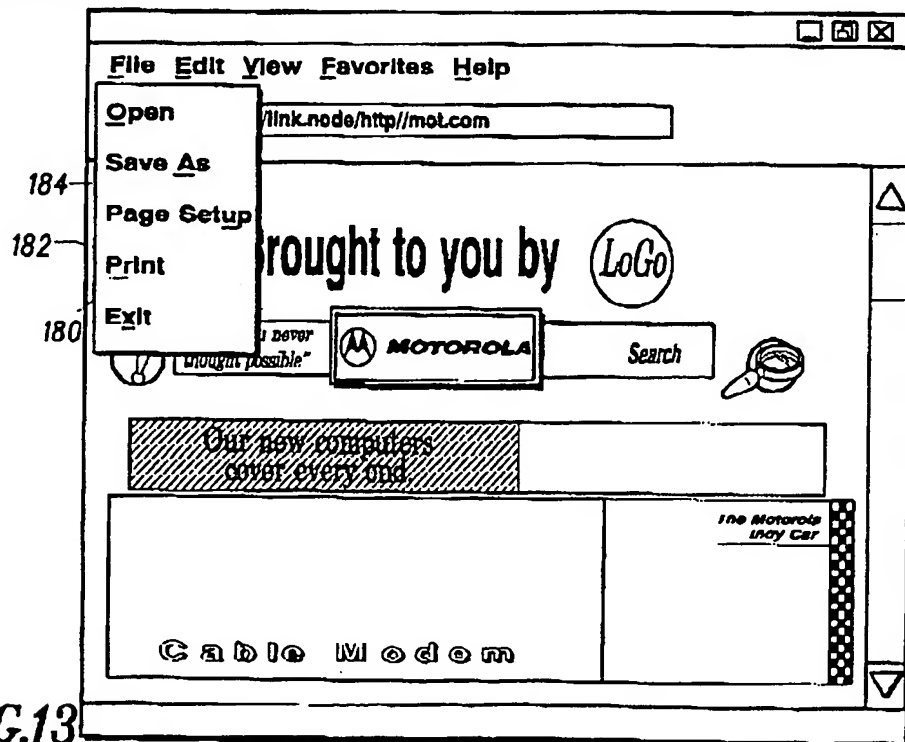


FIG. 13

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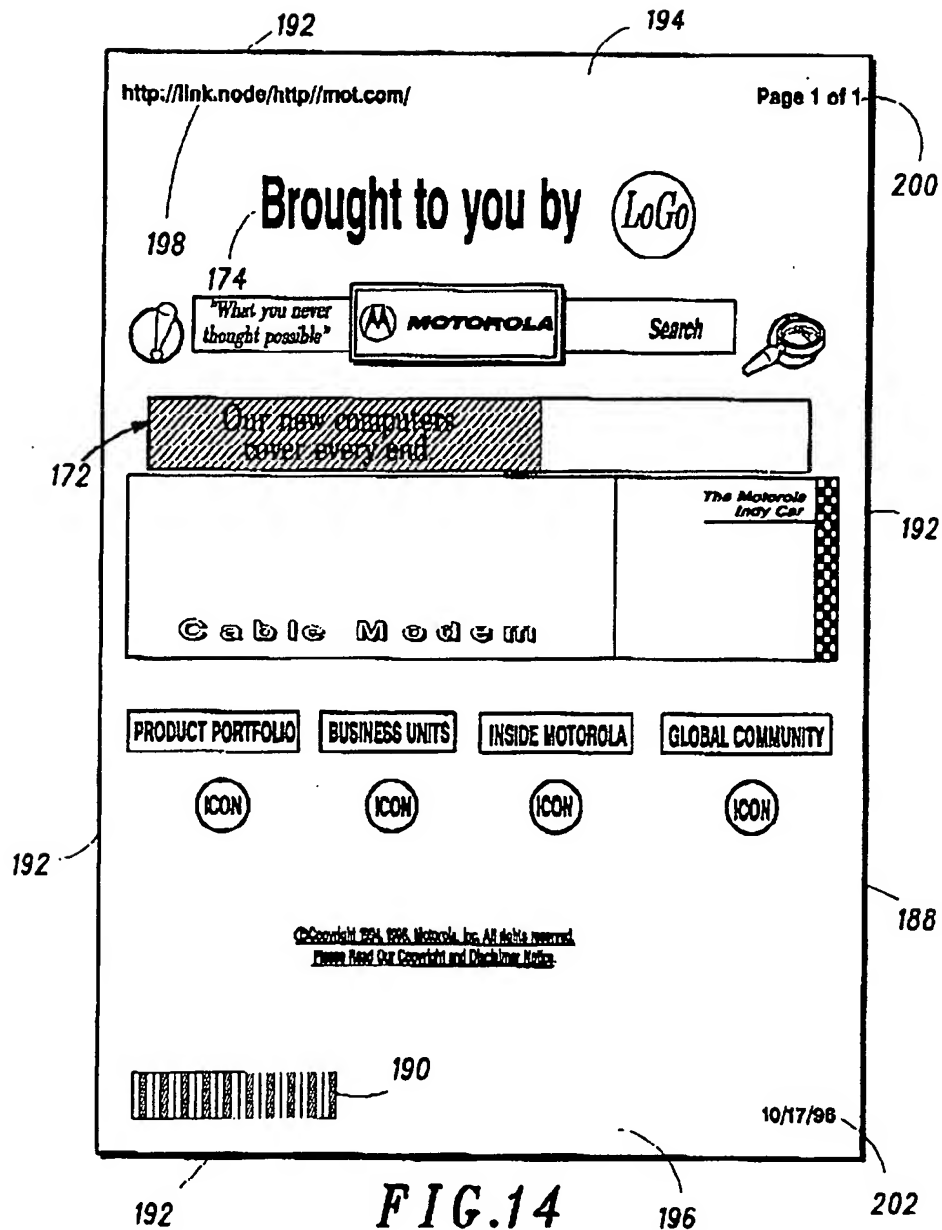


FIG. 14

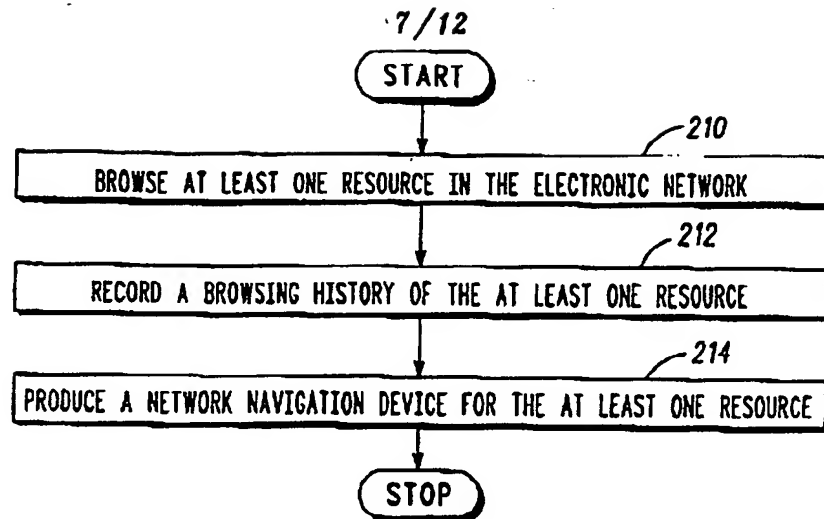


FIG. 15

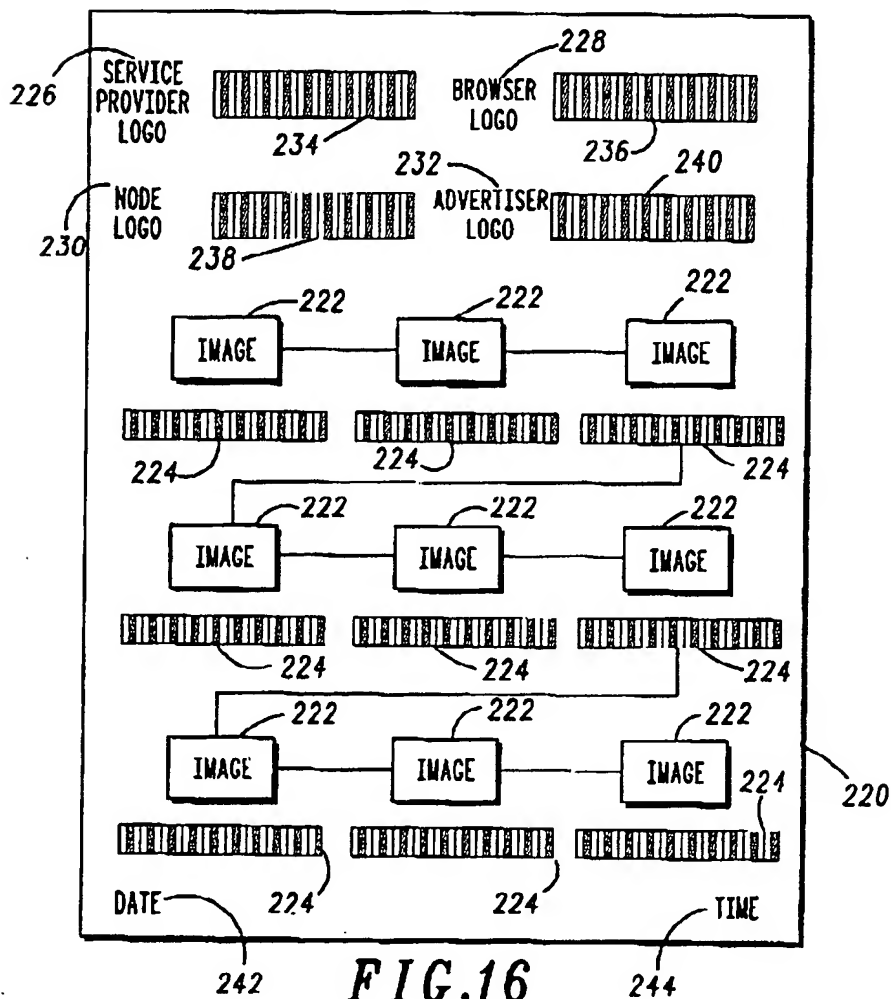


FIG. 16

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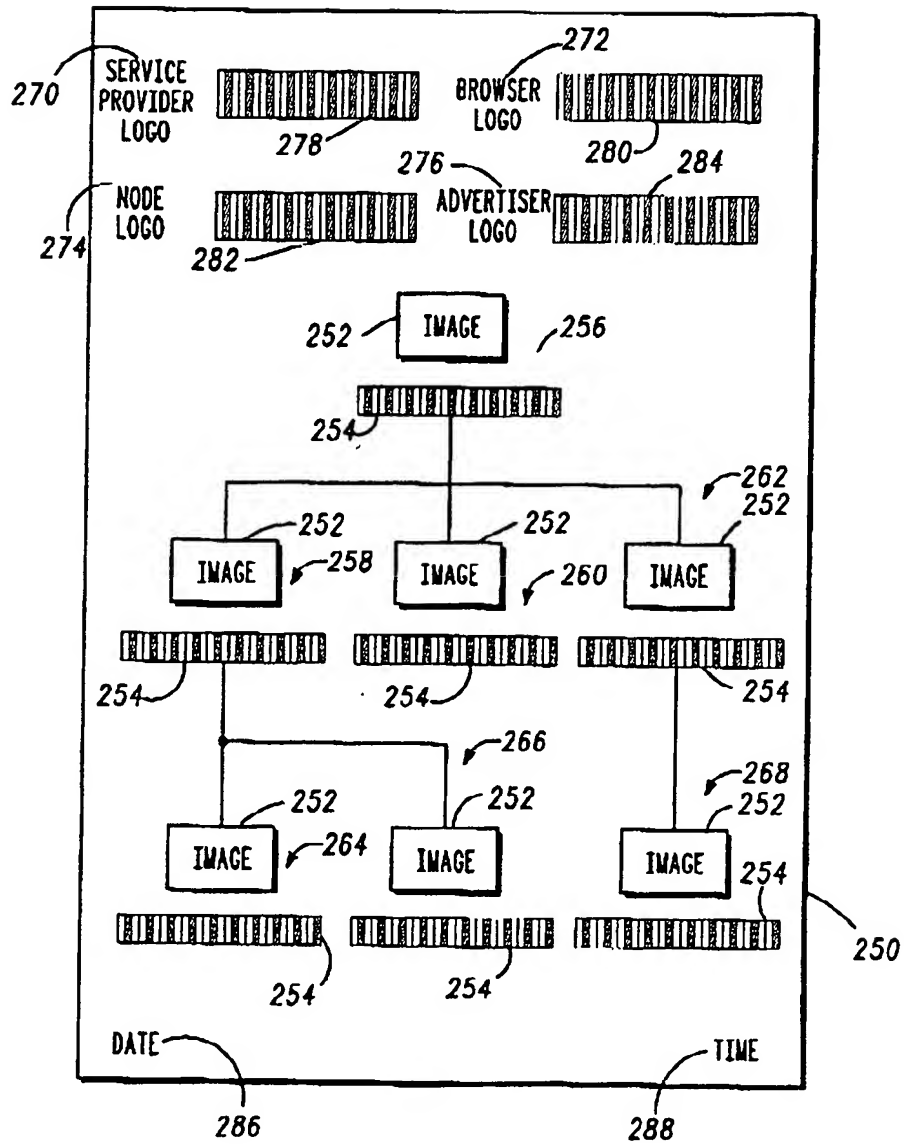
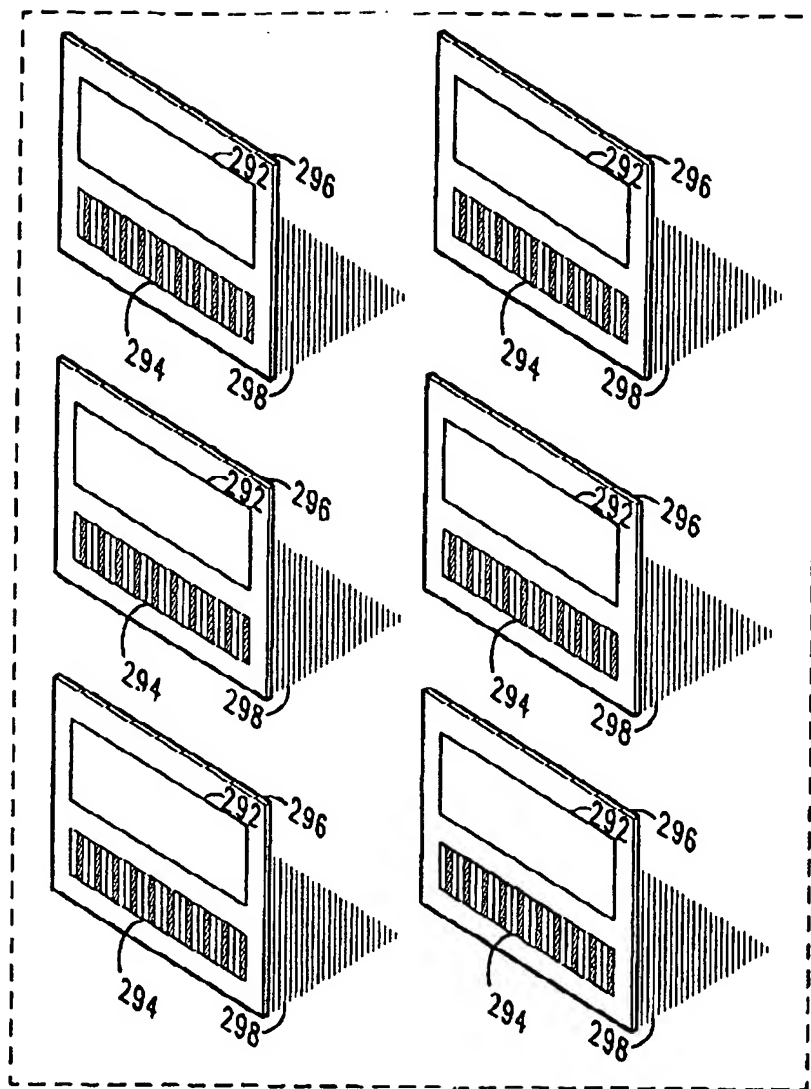


FIG.17

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**FIG. 18**

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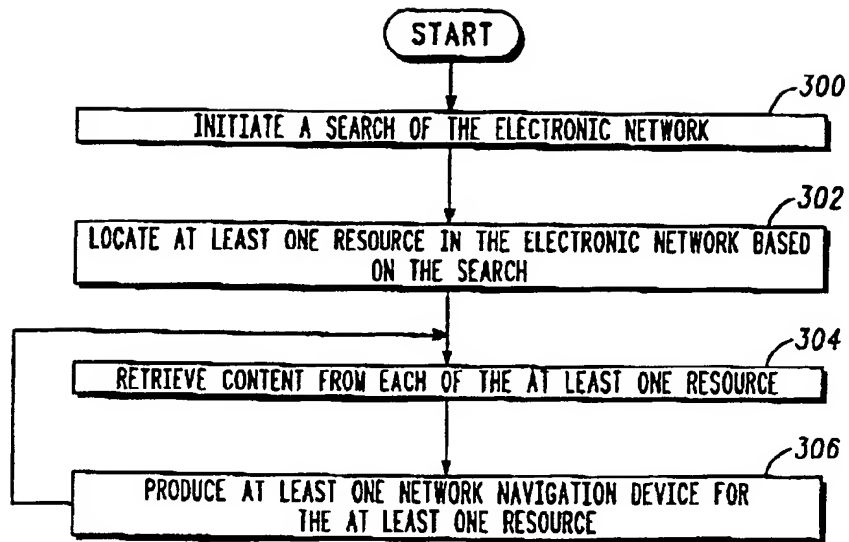


FIG. 19

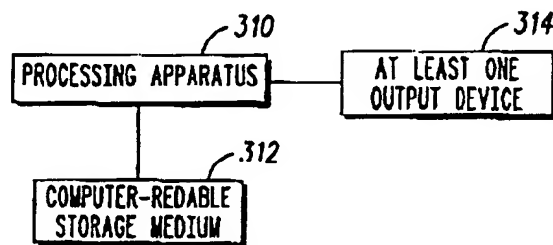


FIG. 20

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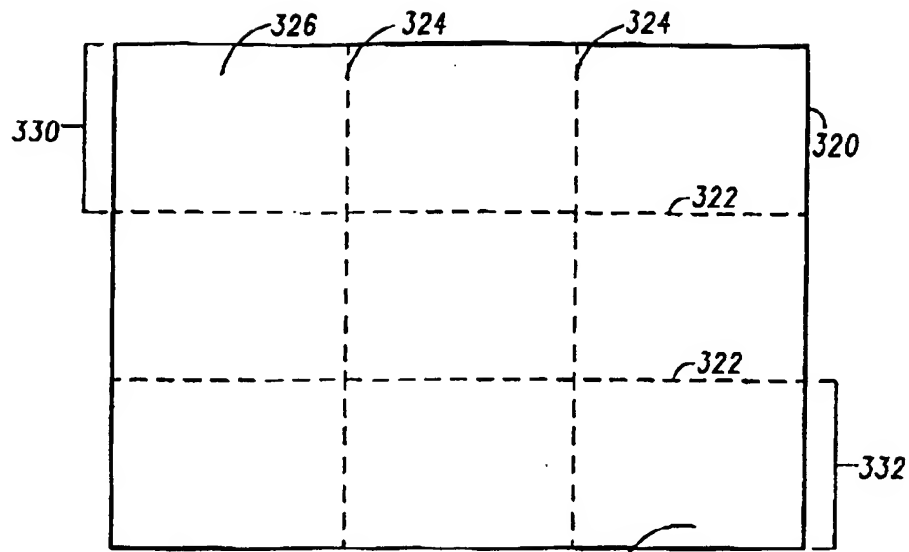


FIG. 21

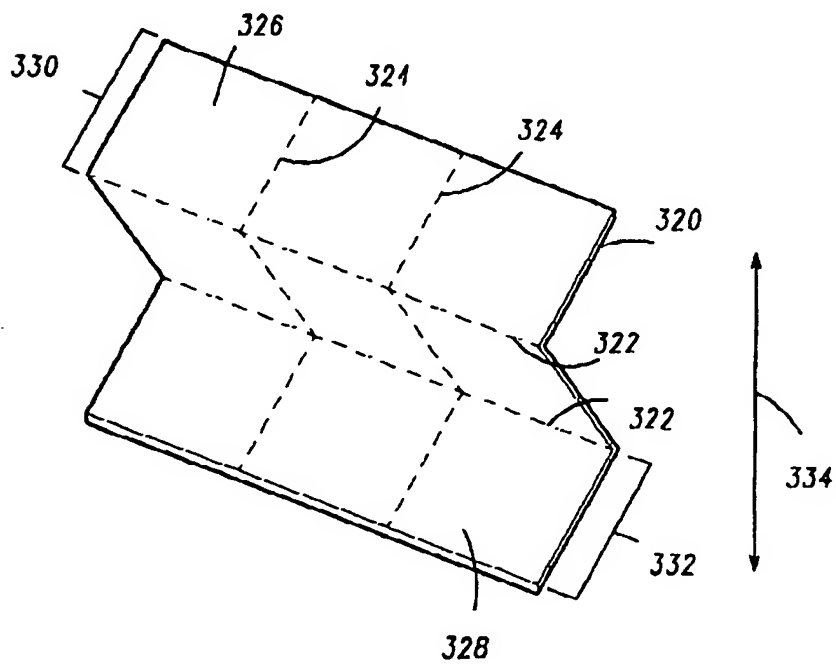


FIG. 22

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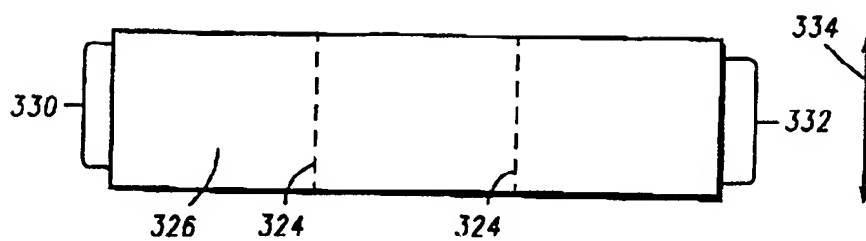


FIG. 23

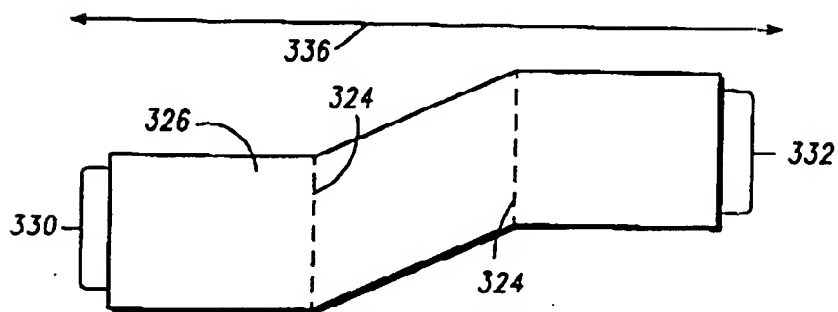


FIG. 24

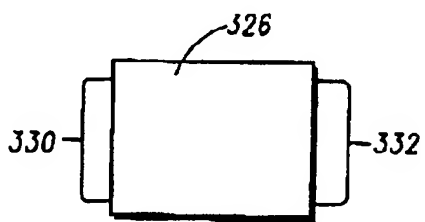


FIG. 25

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/19606

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : H04L 9/00; G06F 3/00

US CL : Please See Extra Sheet.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/335; 395/200.3, 200.33, 200.47, 200.48, 200.49, 200.57, 680, 681, 682, 683, 684; 235/380, 381, 382; 380/20, 21, 22, 23, 24, 25

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
APSElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
STN

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y, P	US 5,590,197 A (CHEN ET AL) 31 December 1996, See Summary on col. 3-4 and also cols. 5-6	1-10
Y, E	US 5,699,528 A (HOGAN) 16 December 1997, See Abstract and also Fig. 1	1-10
Y, P	US 5,671,279 A (ELGAMAL) 23 September 1997, Fig. 1	1-10
Y, P	US 5,677,955 A (DOGETT ET AL) 14 October 1997, Fig. 3	1-10
Y, P	BusinessCards/32 4.1, Infoworld, (31 March 1997), pp.102, Abstract	1-10
Y, P	OnSite Offering Helps Secure Transactions, Internet Week, (15 September 1997), pp.21	1-10

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
E earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*A* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
29 JANUARY 1998Date of mailing of the international search report
10 MAR 1998Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231
Facsimile No. (703) 305-3230Authorized officer
A. Katbab *Jon All*
Telephone No. (703) 305-9667

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/19606

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Banking on the future Marketing Financial Services on the Internet, Newsletter: Multimedia & Videodisc Monitor, 01 May 1996, Vol. 14, No. 5	1-10
Y, E	US 5,640,193 A (WELLNER) 17 June 1997, Fig. 2, cols. 1-4	1-10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/19606

A. CLASSIFICATION OF SUBJECT MATTER:

US CL :

345/335; 395/200.3, 200.33, 200.47, 200.48, 200.49, 200.57, 680, 681, 682, 683, 684; 235/380, 381, 382; 380/20,
21, 22, 23, 24, 25